

# The condition and prospects of the development of higher forest education in Poland

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ARTICLE

**Abstract:** The study presents old and contemporary centres of educating foresters and structural changes and modifications in programs that took place in forestry colleges in the last 65 years. The needs for modernization of forestry studies according to achievements of pedagogical sciences have been indicated. Methods of change in educating foresters in order to satisfy future needs and realize the vision of forests in Poland and Europe have been discussed.

**Key words:** old and modern educating centres for foresters, the need for structural and program changes of forest studies, modern didactics of forest studies, suggestions for modernizing studies.

## Streszczenie:

Przedstawiono dawne i współczesne ośrodki kształcenia leśnego na poziomie wyższym w Polsce. Od 1945 r. ukazano zmiany strukturalne i programowe jakie następowały w tym zakresie na przestrzeni ostatnich 65 lat, w tym dynamikę wzrostu liczby studentów i absolwentów leśnictwa. Omówiono ośrodki kształcenia leśników posiadających pełne uprawnienia akademickie: Kraków, Poznań, Warszawa oraz o uprawnieniach zawodowych: Hajnówka, Lublin, Milicz, Olsztyn, Tomaszów Mazowiecki, Tuchola. Zestawiono zapotrzebowania na kadry z wyższym wykształceniem leśnym z ilością osób corocznie kończących uczelnie leśne. Omówiono potrzeby przeobrażeń i unowocześnienia studiów leśnych w szczególności: rozszerzenia tzw. sylwetki absolwenta; wprowadzenia certyfikacji zawodowej; zwiększenia udziału indywidualnego w toku studiów oraz roli samokształcenia; dokonywania okresowych ocen prowadzących zajęcia przez władze wydziału i studentów; standaryzacji wymagań i egzekwowania wiedzy; wprowadzenia współczesnych systemów budowy testów zaliczeniowych i egzaminacyjnych; wspierania osobistej aktywności edukacyjnej studentów; lepsze organizacje praktyk zawodowych i ćwiczeń terenowych; wzrostu mobilności nauczycieli akademickich i studentów w ramach wymiany krajowej i międzynarodowej; upowszechnienia punktowego systemu rozliczania studentów (ECTS); wprowadzenia nowych przedmiotów przy ograniczeniu czasu poświęconego na nauczanie zagadnień o aktualnie mniejszym znaczeniu, ze względu na zmiany, jakie zachodzą we współczesnym leśnictwie; potrzeby stałego unowocześniania treści kształcenia, form i metod nauczania, pomocy dydaktycznych, wyposażenia laboratoriów; zwiększenia udziału przedmiotów wykładanych w języku angielskim; dążenia, aby przynajmniej semestr lub rok nauki odbywał się na innej uczelni, w tym zagranicznej; rozszerzenia kształcenia praktycznego, aby nie tylko przekazywana była wiedza, ale nabywane umiejętności i kompetencje zawodowe; zwiększenia pomocy materialnej dla młodzieży pochodzącej z uboższych rodzin; wzrostu wynagrodzeń dla pracowników uczelni. Wyrażono pogląd, że kształcenie leśników musi się odbywać dla leśnictwa i ochrony przyrody - jutra, dla zaspokojenia przyszłych potrzeb i realizacji wizji lasów Polski i Europy. Ustosunkowano się również do najnowszych osiągnięć

nauk pedagogicznych, do też tzw. „rewolucji w nauczaniu”, do propozycji zmian systemu obecnie obowiązującego wyrosłego z formuł zaproponowanych jeszcze w XVIII w., między innymi przez J. A. Komeńskiego, do systemu edukacyjnego XXI wieku, na miarę współczesnych potrzeb krajów najbardziej cywilizacyjnie rozwiniętych.

### **The beginnings of the system of forest education**

At the turn of the 18<sup>th</sup> and the 19<sup>th</sup> century the first foundations of forest households came into existence. Forests were excluded from agricultural properties and started to be treated as separate production division with separate administration and economic plans. The demand for wood grew considerably with the development of capitalist economy. Proficient management of large forest farms required professional foresters. Thus, a need to educate for the profession of a forester arose and it was necessary to establish forestry schools teaching at various levels of education (Szymański 1986).

One should distinguish teaching the subject of „forestry” to farmers, lawyers, geographers, naturalists and other professions from teaching a set of various subjects concerning forest studies or other related fields which are useful in the process of education preparing for the profession of a forester. Teaching the subject of „forestry” was included in the program of the Committee of National Education in 1773 and was carried out at colleges and secondary schools as a separate subject or as part of the natural history or a country household. In this regard we have had 240-year old tradition in Poland.

The subject of forestry was taught at the end 18<sup>th</sup> century and in the first half of the 19<sup>th</sup> century on lands belonging to the Polish state before it was seized by Russia, Prussia and Austro-Hungary and took place for example in: Cracow Academy, Vilnius Academy, Lvov University, Law School in Warsaw (1809), School of Administrative Sciences in Warsaw (1811), Agronomical Institute in Marymont (1820), Technical Institute in Cracow (1858), Agricultural School in Czernichów near Cracow (1860) and at other educational institutions (Szymański 1989, Grzywacz 2008).

Educating foresters on the higher level in the period before regaining independence (up to 1918) took place at three centres: Warsaw and Puławy, Lvov and Poznań. Special School of Forestry began the education of foresters in Warsaw in the period of 1818-1832, although consent to open such school was obtained from tsar Aleksander I (from the Romanov dynasty) already in 1816 (Heymannowski 2008).

Teaching foresters was continued by the Institute of the Country Household and Forestry (1840 - 1862), which was founded on the basis of the Agronomical Institute in Marymont (1820-1831). The Institute of Country Household and Forestry was moved to Puławy where it functioned under the same name with a considerable number of academic teachers from Warsaw in the years of 1869-1896 and then it was turned into a Russian institute in the period of 1894-1914. After the outbreak of World War I the college was evacuated to Kharkiv and then to Kiev.

In Lvov, the region of Galicja (which was part of former Polish territory annexed by Austro-Hungary), there functioned Private Forestry Courses in the Polytechnic School in the period of 1871-1874, converted into the National School of Forest Households (1874-1909) and then into the college of Higher Forest School (1909-1919). In Żabikowo near Poznań Halina Agricultural School (Halina was the name of the wife of the founder, August Cieszkowski) conducted activity for 7 years only (1868-1875).

Few institutions of higher forest education existed on ethnically Polish lands in the final years of the period of the Partition of Poland, i.e. at the beginning of the 20<sup>th</sup> century. The only college educating for the profession of a forester was the Higher Forest School in Lvov and the Readership

Units at the Agricultural School of the Jagiellonian University in Cracow, Lvov Polytechnic School and Agricultural Academy in Dublany constituted scientific support units where forest subjects were taught to future farmers and students of other subjects. Newly created Higher Forest Courses operated in Warsaw since 1916 (until 1920), constituting the starting point for the future Department of Forestry and the Warsaw University of Life Sciences (Miklaszewski 1938).

In the interwar period until the outbreak of World War II, three academic centres conducted activity in Warsaw (University of Life Sciences, WULS-SGGW), Poznań (the University) and Lvov (The Polytechnic University) and the Readership Unit at the Agricultural School of the Jagiellonian University in Cracow was converted into the Chair of Forestry (table 1). Forestry studies originally lasted 3 years (later 4 years) and graduates obtained the professional title of an engineer. In Lvov and Poznań they were common forest and agricultural departments and there was an independent forestry department in WULS-SGGW (Żabko-Potopowicz, Więcko 1965).

It could be claimed that the system of forest education at the basic professional level (schools for foresters), secondary level (forestry high schools) and higher level (forestry departments at universities) was created mainly for the needs of the administration of newly created State Forests in 1924 and also for great forest private properties. That system was being permanently improved and transformed and the process was violently stopped in September 1939, as a result of the outbreak of the II World War and through the Nazi and Soviet occupation of our country (Grzywacz 2011)

During the II World War teaching for the profession of a forester was not stopped. Warsaw University of Life Sciences conducted secret (underground) classes in the period of 1939-1944 (until the outbreak of the Warsaw Uprising) and Warsaw Underground University of Western Territories (being a continuation of the Poznań University closed by Nazis) conducted classes in the period of 1940-1944. The Polytechnical University of Lvov continued activity in a limited range during the Soviet occupation in the period of 1939-1941. Later on, during the German occupation of Lvov (1941-1944), only forestry courses were carried out (Grzywacz 2006).

### **Reconstruction of the higher forest education after World War II**

In the first period after World War II, the system of four year undergraduate studies (the degree of an engineer) was binding, just as before the war. The regulation of 28 October 1947 started major transformations of the academic life, in the system of studies and forms of development of the research personnel.

Yet the Act on higher education of 15 December 1951, considerably amended in 1958 and 1966, introduced even more significant changes. Transformations in the system of forest studies resulted from social and political transformations and depended on introducing new subjects, e.g. the bases of Marxism-Leninism and also adjusting content of teaching to the adopted ideological principles of the new socialist system. Additionally they concerned changing names of subjects (e.g. political economy and economics of forestry instead of the social economy and the forest policy), introducing physical education and classes at the School for Servicemen and also teaching foreign languages to a larger extent, including Russian. Moreover some „fallacious, bourgeois views” had to be removed (e.g. in genetics, the evolutionism) and „the views of Soviet scholars” introduced instead (Kryczyński 1977, Grzywacz 2006).

In 1951 two-level studies were introduced, i.e. 7-semester engineer program and 2-semester master program (graduates of the old type programs were leveled with graduates of master's degree programs and were allowed to use the professional title of master engineer). Additionally there was a possibility to obtain the degree of forestry engineer as a result of quick courses organized and run by the Chief Technical Organization (NOT).

Those 2-level studies were criticized as it was believed the graduates of the 1<sup>st</sup> level program didn't acquire complete education and the number of graduates of the 2<sup>nd</sup> level program was limited.

The only effect of the new program was graduates (forestry engineers) taking up their career earlier. In 1956 uniform 5-year study program resulting in the degree of a forestry master engineer was introduced again. The study program included 3560 hours: 1860 hours of lectures, 860 of laboratory exercises and 840 of field exercises apart from apprenticeship in forest inspectorates and forest management offices (not including so-called graduation practice, devoted to the collection of materials to master's thesis). In the same period an extramural 5-year study program was introduced, which was supposed to lead to obtaining the degree of a forestry engineer.

In 1965 a new agenda for forest department studies was introduced. Despite various pressures, it was not transformed back into 2-level studies but profiles of education appeared. Those were specializations of which two turned up most often, i.e. forest management and forestry engineering and technical devices. Within the frames of educational profiles they designed graduation specializations (or diploma specializations) and optional courses. The system of practices was changed and the program was modernized according to forest practice requirements and scientific achievements. For the first time they introduced post graduate studies in the field of forestry. Further changes were introduced to study programs in 1970, leaving uniform master studies and eliminating the two specializations. Study programs were further diversified by specializations on the 4<sup>th</sup> and 5<sup>th</sup> year of studies.

Throughout the period of time analyzed here (1946-1990) higher education of foresters was conducted invariably in three centres in Cracow, Poznań and Warsaw (table 2). The Lvov Department after a few reorganizations nowadays constitutes a basis of a separate college today, i.e. the State Ukrainian University of Forestry and Technology.

Since 1940s the number of students and graduates fundamentally kept steady. Changes which appeared were of fluctuation character resulting from demographic processes, organizational transformations of higher education and changes of student interest in taking up forestry. Every year, as a result of central planning of the size of recruitment for studies in the national education units (there were no private colleges), the average of 300 people (240-360) were accepted to full-time forestry studies, with over 2-3 candidates applying for one place. The principle of „simple reproduction” or of limiting needs in relation to expectations and job opportunities in the national economy was applied. There were no significant differences between specific forestry departments in terms of the number of candidates accepted for the first year of studies, the number of graduates and plans and programs of studies (Kryczyński 1977; Grzywacz, Gajda 1992, Grzywacz 2008b).

The number of students on forestry studies has grown steadily since the academic year of 1990/91. In 2009 there were as many as 5735 students and it was the greatest number in the entire history of forestry higher education. The consequence of that process is a steady increase of the number of graduates. It reached 750 persons annually in the last 5 years on all types of studies. The dynamics of that growth is shown in tables 3 and 4. The assumed employers of graduates (including the largest one, i.e. National Forests) are not able „to engage” such a number of forestry specialists.

Such a situation is not exceptional for forestry departments but characteristic for the entire higher forest education and is an effect of general changes and the tendency in this respect in Poland. In the decade of 2000/01-2009/10 the number of higher education institutions rose from 310 to 461 and the number of students from 1584 thousand to 1900 thousand. 1267 thousand persons study at 131 public colleges, which constitutes 67 % of the student body. In recent years the number of students has been slightly decreasing in comparison to the record-breaking years of the academic year 2005/2006 when it reached almost 2 million. In the last 20 years scale rate in the higher education grew over four times (gross rate from 12.9 in 1990/91 to 53.7 in the academic year of 2009/2010 and net rate - respectively from 9.8 to 41.2). GUS statistical study titled „Higher education institutions and their financing in 2009” (2010) delivers a lot of detailed data in that respect.

### **Current condition of forestry higher education**

Political and social changes which took place in Poland after 1989 caused transformations in the economy and on the labour market, which changed young people's educational ambitions and goals and tasks of the educational system. Those transformations concerned forest higher education too. Since 1990s it has undergone essential transformations reflected in legislative acts. It received full autonomy and decentralization of the decision making process which means that nowadays universities decide about the number of educated students and forms of studies on their own. The educational offer has been extended and new fields of study, and specializations have been created. Moreover, new Higher Education Vocational Schools and plenty of Non-State Schools of Higher Education have been established. The system of education was diversified and the principle of 2-level studies (bachelor's, engineer's and master's programs) has been introduced. Fee-paying schools appeared (part-time, extramural and evening). Colleges have established numerous branches in various towns. Inventions concerning telecommunication and computer science (computers, Internet, photocopier) changed traditional forms of teaching and databases of libraries, multimedia teaching aids etc. came as assistance to both teachers and students.

In the period of 65 years, after World War II, three academic forest schools did not develop considerably in terms of academic staff, in spite of the increase in the area of forests in our country, the increase of wood acquisition and most of all despite growing importance of protective and social functions of forests (e.g. recreation and tourism, protection of forest nature resources, forest education of the society). In the last 20 years we can notice a stable level of employment of academic teachers and significant fall in the engineering, technical and support staff who are directly involved in research works. The number of forestry students rose by 300% in that period, which resulted (and still results) in the increase of the number of didactic classes per one academic teacher and, at the same time, in decrease (by 30-70%) of time devoted to research. Academic teachers constitute approximately 65% of the whole research personnel in forestry universities (Klocek, Grzywacz 2007).

The number of people who gained a university degree in the field of forest sciences in the period of 2000-2010 annually was as follows: 35 persons got PhD degree, 9 persons gained the academic degree of doctor habilitated and 5 persons the academic title of professor of forest sciences (table 5). The development of post-graduate (doctoral) studies is unusual in the history of forest studies. In the past 11 years there have been 190 doctoral students on average (in forest departments and at the Research Institute Forest), performing their examinations at full-time (stationary) and part-time (non-stationary, extramural) studies (GUS 2011).

Currently, 9 centres educate in the profession of a forester on the higher level and the tenth centre in Biłgoraj, in spite of its educational capabilities, does not conduct teaching extramural students due to a small number of candidates. Those include 3 old, traditional centres with full academic authorizations (stationary, non-stationary and doctoral studies, authorization to grant the title of doctor habilitated and to apply for granting the title of a professor) in Cracow, Poznań and Warsaw. The remaining 6 centres are authorized to grant the professional title of a forestry engineer. Those include: the Faculty of Forestry of Polytechnical University of Białystok in Hajnówka, Higher School of Environmental Management in Tuchola, the Institute of Forest Sciences of the University of Łódź in Tomaszów Mazowiecki, the Didactic Centre of Poznań University of Life Sciences in Milicz and the two centres which conducted enrollment for the first time in the academic year 2010/2011, namely: the Faculty of Shaping the Environment and Agriculture of the Warmian-Mazurian University in Olsztyn and Agrobioengineering Faculty of Lublin University of Life Sciences (table 6). It is known unofficially that other universities also made (or are still making) efforts to establish the Forestry Faculty, e.g. National Training College in Chełm and the College of Domestic Household in Kutno in its Department in Koszalin. We shall not discuss here the question whether it is desired to found

such a great number of centres preparing staff for the needs of forestry and forestry related fields on the higher level of education. Moreover, we must bear in mind that there are also graduates of related fields who compete with forestry graduates on labour market in some specific areas such as national and landscape parks, regional directorates of environmental protection and administrative units of National Forests. The number of such graduates was almost 12 times higher than the number of forestry graduates in recent years (table 7).

### **Needs to reform forestry studies**

The reform of the educational system undertaken in Poland after 1989 on all areas and levels of education was caused by political transformations. Gradual swap from the planned economy to the free market economy made people aware that state control was being replaced by private and social enterprise, which required introducing serious changes in programs and the organization of education. It was recognized that the existing model based on transmission and reproduction model should give way to the model which puts fundamental stress on extensive knowledge and shaping intellectual and practical skills at students. It was acknowledged that besides changing the professional profile of the graduate, reorientation of purposes, proper selection of content of the education and modernizing forms and methods of their realization, it would be necessary to change organization of studies. It was assumed that the new model should be more flexible, less formalized and should create better opportunities for individual studies considering students' predispositions and interests. It should also react quicker to expectations and needs of the changing labour market. The first publication in that respect was drawn up at the editorship of Gajda titled „Modernizing education at agricultural colleges” (1991).

In reference to that course of action prof. A. Grzewacz initiated a meeting of deans and deputy deans of three forest faculties which took place in Warsaw on 15 May 1991. The purpose of the meeting was communicating achievements and aims in reforming forest studies in Krakow, Poznań and Warsaw. The meeting was conducted with contemporary deans (Andrzej Grzywacz, Bogusław Fruziński and Stefan Kowalski) as chairmen and was held „in a friendly atmosphere and the assumption that we wish to work out uniform principles of reforms of teaching in the field of forestry with respect to existing diversities of faculties, cooperation with retaining identity, without the unnecessary competition.” A proposal to issue materials which would be helpful and inspiring with discussions and plans to modernize forest studies was one of the outcomes of the meeting. It was achieved in publication titled "Problems of reforming forest studies" (1992), published at the editorship of A. Grzywacz and E. Gajda. It includes 18 studies concerning up-to-date plans of studies and proposals of changes (both stationary and non-stationary), problems of the supply of textbooks and coursebooks, practical training and the role of Forest Experimental Units in that respect. A view expressed in the publication stated that „on account of economic and educational delays we cannot afford further temporary changes, uncertain didactic experiments and superficial reforms but a great scope of work requiring much courage and quite a lot of deliberation is awaiting us” (Grzywacz, Gajda 1992).

Unfortunately, planned reforms did not turn up into profound changes and expected results. It seems that from a perspective of 20 years that have passed since the moment of those discussions, reflections and decisions, the main flaw was conservative attitudes and attachment to contemporary forms and methods of work presented by the teaching staff, small interest in implemented changes presented by the students and too serious interferences and regulations of central authorities of the higher education who originally had agreed not to interfere. A lot of views and intentions expressed on forestry faculties at that time are still up to date or at least a significant majority of them.

Another attempt to modify study programs was undertaken from the initiative of the Polish

Forest Society in February 2003. The meeting was organized in Forest Experimental Unit in Siemianice and the outcome of that conference was 20 papers issued beneath the editorship of A. Grzywacz titled „Need of transformations of forest studies in Poland” (2003). A wide range of problems associated with functioning of the higher forest education and the possibility of reform actions were described then. However that attempt did not lead to desired and needed effects either.

Shortly before Polish access to the European Union new prospects and a broader point of view appeared also in the scope of higher education, including forest studies. In November 2003, from the initiative of the Polish Academy of Skills in Cracow a conference „Polish Forestry in United Europe” was organized and the program paper titled „Educating foresters for Europe” was presented (Grzywacz, 2005).

From the above mentioned meetings and conferences it is possible to quote main conclusions, demands and reflections which are still valid. The basic principle for actions modernizing the process of education must be a far reaching vision. Educating foresters must be performed for the sake of forestry and the conservation of the nature of tomorrow, for satisfying future needs and expectations, for realizing the vision of forests and the forestry of Poland and Europe in the 21<sup>st</sup> century. For the forestry of the future that is most likely to come and to a smaller degree for the forestry as it exists at present (Grzywacz 2005)

#### **General demands put forward for consideration in the process of transformations of forest studies:**

- Extending the graduate’s profile from a specific profession of a forester to the group of professions connected with forestry, natural environment and conservation of natural resources,
- introducing the system of professional certification, extending individual forms of studies and choice of subjects (on the faculty, university or other universities),
- increasing the number and diversities of optional courses,
- making periodic evaluations of those conducting classes, by authorities of the department and students,
- introducing standardization of requirements and execution of knowledge,
- modern system of building tests and exams,
- supporting students’ individual educational enterprise,
- assistance in organization of practices, internships, various forms of voluntary services and contacts with forest institutions at home and abroad,
- increasing the availability of Internet services, libraries, digital maps, general and specialist servers and research and measuring devices,
- increasing the mobility of university teachers and students,
- popularizing the credit system of accounting students (ECTS),
- new subjects e.g. European forestry, conservation of nature in Europe, geography of forestry, world forestry and others,
- permanent process of modernizing contents of the education, forms and methods of teaching, equipping with teaching aids, textbooks and laboratory equipment,
- conducting part of classes in English,
- aiming at one semester of studies (at east) to take place in a foreign university or other didactic unit in Poland,
- extending practical training and obtained competencies,
- increasing financial help for students in bad financial condition,
- introducing diverse actions (non-financial) leveling chances for educational success for students of poorer classes of society (mainly from poorly educated workers’ and peasant families).

### **Detailed demands put forward for consideration in the process of modernizing forest studies:**

- Teaching innovative and alternative thinking, with categories of the forester profession, and to a lesser degree of contents included in regulations, instructions and trade norms,
- teaching responsibility for individual and team work,
- extending educational offer in the direction of „ecological social service” so-called green sphere of natural resources management,
- teaching independence, entrepreneurship, dealing with personal and professional problems and how to change a profession (if the need arises),
- extension of the environmental, legal and economic education in the scope of the organization and management, marketing and promotion, team management and foreign language skills (mainly English),
- serious limiting teaching specific technologies, instructions, guidelines, encyclopedic knowledge, old fashioned contents,
- extending education of social subjects e.g. social Communications, conducting economic negotiations, ecological (forest) education of the society etc.,
- making critical analysis of the structure of hours allocated for teaching specific subjects, according to their current importance in practical forestry and conservation of nature,
- confirming the annual duty to introduce in each subject (both lectures and practical classes) new content and eliminate historical knowledge which is out of date and not valid any more,
- new optional courses with more general, European character of educational content,
- preparing the comparative analysis of general and detailed plans and programs of education from 20 best known faculties of forestry in European countries (Aberdeen, As, Brno, Eberswalde, Freiburg, Goettingen, Helsinki, Joensuu, Kaunas, Copenhagen, Nancy, Oxford, Praha, Sopron, Uppsala, Wageningen, Vienna, Zurich, Zwoleń etc.) in order to get inspiration towards the evaluation of current and future plans of forest studies in Poland (Grzywacz 2005, 2008a).

The forest higher education is not an isolated island, although in terms of the number of students and academic staff it constitutes only about 0.3 % of the whole area of this type of educational and social activity in our country. When modernizing this field of education one should take into consideration documents which set standards of the European higher education, for example: Great Card of European Universities (Bologne 1988), Erfurt Declaration (1996), Lisbon Convention (1997), Report of the European Commission "Education for Europe" (1997), Bolognese Declaration (1999), numerous materials from conferences of ministers responsible for the higher education of European countries, study papers of international organizations engaged in shaping the European system of forest education (United Nations Forum of Forest, Ministerial Conference on the Protection of Forest in Europe, Silva Network, International Union of Forest Research Organization, International Forestry Students Association, Cooperation in the field of Scientific and Technological Research (COST), Standing Forestry Committee, European Forest Institute (EFI, Joensuu Finlandia) and detailed studies (both of international and domestic origin) concerning education of foresters. The Bolognese Declaration recognizes the following basic aims of education at universities: preparing graduates according to the needs of labour market, preparing for active participation in life of democratic society, developing and supporting the advanced knowledge and personal development of individuals undergoing educational process (Grzywacz 2005).

It is not possible to discuss here important documents and legislative acts which have recently appeared and influence the shape of the future higher education in our country such as „Polish higher education. The state, conditioning and prospects" (2009), which is a vast paper prepared by KRASP (Conference of Rectors of Academic Polish Schools) or „The strategy of development of higher education 2010-2020," which is an environmental project (2009) prepared from the initiative of



KRASP. Other important documents are as follows: „The strategy of development of higher education until the year of 2020” prepared by consortium Ernst & Young and ordered by the Ministry of Science and Higher Education (2010) and „The act on the amendment to the act of higher education of 18 March 2011 about university degrees and scientific titles and university degrees and academic titles within the scope the art and about the amendments to some other acts.” When dealing with strategies concerning the future of higher education in Poland one should consider results of demographic surveys. It is predicted that in the years of 2008-2020 the number of citizens aged 18-24 (which is traditionally a student age) might fall by 1.5 million, which means that the number of students might decrease by 600-800 thousand. It is difficult to calculate the effect on forestry studies candidates but the tendency observed now proves the decrease of interest in non-stationary studies.

Universities have already created or are still working on „The strategy of development” (having consulted or still consulting the Senate and Rector authorities) and that document includes guidelines for the field of forestry as well. Another factor which has direct effect on the „climate” of reforms is the current and future economic and demographic situation of the country.

We are not lacking in materials, guidelines and recommendations concerning reforms, however it is necessary to implement them in the practice of everyday didactic work in our forestry colleges (both the traditional ones with complete academic authorizations and the ones established recently, which possess the status of engineer studies). In that process we cannot miss the opinion of main employers of forestry graduates, including State Forests and representatives of the youth being educated for the profession of a forester, i.e. student governments.

### **Contemporary trends of the development of educational methods**

Immense progress in many fields of science and knowledge caused and still causes significant or even revolutionary changes in teaching, which considerably modify methods and means of education, including higher education. An example of that phenomenon is an exceptional success of the book written in a popular way by G. Dryden and J. Vos titled „Revolution in teaching,” which was published in many countries and translated into many languages. Polish first edition appeared in 2000. In that extensive book we can find results of a great deal of research and observations concerning many scientific disciplines and on that basis a new theory of learning process and a vision of learning and improving society was presented. It was assumed that we live at the beginning of the greatest revolution in the history of development of mankind. We know how to store the entire knowledge collected so far over the centuries and how to make it available at the same time almost worldwide. The revolution in teaching must follow the revolution in means of mass communication. Everyone can benefit from the era of the Internet and other inventions of advanced technology.

I am convinced that recommendations and pieces of advice included in that book should constitute fundamental principles and ways of conducting classes, also at forest universities. As a means of an incentive to read „Revolution in teaching” I am going to quote some "words of wisdom" about teaching included there:

- learning is most effective when we enjoy it,
- positive attitude is the most valuable thing in learning,
- traditional educational system is outdated,
- if you want to learn something - do it,
- the key to success in learning and professional career is getting to know your personal style of learning and working,
- whenever possible, students should have an opportunity to choose and be responsible for their own education,
- our brain can learn incessantly, from birth until the end life,
- we discuss a lot about the desire to have perfect schools whereas we are satisfied with the

average ones we have,

- we learn 10% of what we read, 20% of what we hear, 30% of what we see, 50% of what we see and hear, 70% of what we say, 90% of what we say and do,
- the grade should consist of 50% of self assessment, 30% the of assessment of colleagues and 20% of the assessment of teachers and supervisors,
- those of you who can teach - teach, those who cannot - lecture,
- you learn through what you see, hear, sense with taste and smell, what you touch, what you do, imagine, sense intuitively and feel

An educational offensive is currently taking place in many countries leading the way in terms of the progress of civilization. That offensive aims at changing the system which originated in the 17th century and which was introduced to a great extent in Europe (also in Poland) by Jan A. Komeński (1592-1670) and which is still in force. That system must be changed into a system which matches contemporary needs and takes advantage of the newest achievements. Those systems have been called „e” and „E.” Education „e” is already outdated and education of the „E” type is considered to be the promising education of the future. Kenneth G. Wilson, a Noble prize winner in the field of physics, is a great supporter of „E” and he presented ideas of the new education also in Poland (Głazek 2011). The system is directed towards educating students (or pupils), teaching values and building character. The measure of progress is not assessments similar for everyone but information about individual progress in knowledge and skill acquisition. Checking short-term memorizing in order to pass a subject is replaced with assessment of work in practice. Teachers are evaluated on the basis of the development of skills being taught. Differences between students are taken into consideration and conditions for the development throughout the entire life are created. Education of the 21<sup>st</sup> century cannot be based on various forms of obligation but on the process of development at free will. It is assumed that achievement of the level of an expert in any domain requires 10 thousand of hours for improving skills. It indicates that if you want to be 'somebody' in the profession you cannot stop education after graduation since studies provide only 1/3 of the time necessary for developing knowledge and skills. Hence the need for long-term learning, e.g. post-graduate studies, courses, trainings, education and most of all it is crucial to do self learning and read a lot of books and professional newspapers and be active and creative in the professional and public work.

Table 8 presents examples of the differences between the currently dominating system of education „e” and the future system „E”. The present situation where the „omniscient” teacher passes on his knowledge to students is not a model for a situation in which graduates will find themselves at work or in real life where teamwork is crucial as well as the ability of continuous learning throughout the entire life. Individualized teaching suited to student’s abilities and needs is expensive and requires a lot of highly skilled teachers. Engaging older colleagues, friends or students would constitute a good solution. The need to learn from one another is a key problem of the new education and creating schools of such system encounters social obstacles from both students and academic teachers since it requires from both parties even greater effort, permanent activity, rebuilding programs, new materials, didactic aids, ways to control knowledge and assessment of progress (Kuczyński 2011). A worldwide movement for the professionalization of teaching is needed. Learning is a hard work and requires an effort and therefore even best educated and regularly studying individuals approach the prospect of increased competition for even higher level of education reluctantly or at the outmost with moderate enthusiasm (Gołab-Meyer 2011).

Apart from financial and organizational problems connected with reforming college, it is also essential to discover abilities of the environment, their willingness, threats, state of preparations and additional financial and non-financial satisfaction. It is obvious that the process of implementing the new way of teaching advances quite unwillingly and without enthusiasm even in the most developed countries although there is a prevailing view that changing „e” for „E” constitutes an essential

condition for further development of those countries and maintenance of the leading role in international relations. That is why it is discussed that it might be necessary to force the need for changes at schools and colleges for the benefit of further civilization development of societies.

The process of introducing the newest educational „technology” is not simple and fast. It seems that at colleges (including forestry ones) it would be a good idea to get acquainted with new methods and means and first try to implement current pedagogic and educational knowledge gathered in generally available national materials and textbooks (e.g. Kunowski 2009, Kruszewski 2005, Okoń 2009, Schrade 2010) „on the way” to what seems to be a more distant target.

Such a need of modernization of didactics is noticed by Warsaw University, which carries out a project „Modern university” and organizes conferences within the frameworks of the program of university teachers’ improvement. A lot of ideas and suggestions included there, would also be helpful with modernizing didactics in forest faculties.

Polish future forestry will depend on the new forestry staff. It requires modern education and good schools and universities. I would like to conclude my presentation with the sentence I have already uttered, namely „a great scope of work requiring much courage and quite a lot of deliberation is awaiting us.”



Ryc 1. Publications concerning the issues of reforming forestry studies in Poland.

Table 1. Universities in interwar Poland (1918-1939) educating foresters or conducting lectures in the field of forestry

Cracow	Faculty of Forestry in Agricultural College of the Jagiellonian University (1921 - 1939), not educating forester students, didactic and research unit
Lvov	Higher Forest School (1909 - 1919) Agricultural and Forest Faculty of Lvov Polytechnical University, since 1919 established after merging the Agricultural Academy in Dublany near Lvov and Higher Forest School
Poznan	Agricultural and Forest Faculty of the University of Poznań, since 1919
Warsaw	Higher Forest Courses (1916 - 1918), Royal Polish Warsaw Main School of Farming (1918) Faculty of Forestry, Warsaw, since 1918.

Table 2. Stages of development of forestry faculties in universities after 1945

Faculty of Forestry, Warsaw University of Life Sciences - SGGW	The first assembly of the Faculty Council after war activities were over took place on 5 March 1945 in Skierniewice; the didactic activity was resumed in May 1945 in the pavilion No. 2 at Rakowiecka Street, in February 1946 Forestry Faculty was divided and the Branch of Wood Technology was established, in 1951 it was converted into the Faculty of Wood Technology of WULS-SGGW in September 2003 the Faculty was moved from pavilion No. 3 at 26/30 Rakowiecka Street to the new campus in Ursynów at 159 Nowo ursynowska Street, building No.34
Faculty of Forestry University of Agriculture in Cracow	Higher forestry courses were created in November 1945 at the Forestry Research Institute in Krakow; after connection with the Forestry Chair of the Jagiellonian University they initiated the Forestry Department of Agricultural and Forest Faculty of the Jagiellonian University, 1949, the Department was transformed into the Forest Faculty of the Jagiellonian University, 1951, enrollment was suspended and in 1954 the Faculty was shut down completely, Reopening took place after 9 years in 1963 within the structure of the Higher Agricultural School with its seat at 37 Św. Marka Street, 1972, the Faculty of Forestry is part of H.Kołłątaj Agricultural Academy, 1982, the Faculty of Forestry obtains a new seat at 24 Aleja 29 Listopada, The Faculty of Forestry has been functioning since April 2008 within the structure of the University of Agriculture.

Faculty of Forestry, Poznan University of Life Sciences	In May 1945 didactic classes started in the Forest Department of the Agricultural and Forest Faculty of Poznań University, in the academic year of 1949/1950 it became an independent Faculty of Forestry, 1951, the Faculty of Forestry and Agricultural Faculty were distinguished from Poznań University and initiated the Higher Agricultural School in Poznań, 1972, Agricultural Academy was established; changed its name into August Cieszkowski Agricultural Academy in 1996, 2008, Agricultural Academy was transformed into Poznań University of Life Sciences.
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Table 3. Students of forestry studies (all types in total)

Academic year	Number of students
1960/61	1315
1965/66	1588
1970/71	2063
1975/76	1639
1980/81	1647
1985/86	1466
1990/91	1956
1995/96	2804
2000/01	3492
2005/06	4768
2009/10	5735
2010/11	5407

Data according to GUS

Table 4. Graduates of forestry studies (all types)

Years	Number of graduates	Annual average
1945 - 1950	456	76
1951 - 1955	1784	357
1956 - 1960	717	134
1961 - 1965	642	128
1966 - 1970	1237	274
1971 - 1975	1649	330
1976 - 1980	1298	260
1981 - 1985	1293	259
1986 - 1990	1129	226
1991 - 1995	1490	298
1996 - 2000	2304	461
2001 - 2005	2853	571
2006 - 2010	3715	743

Table 5. Degrees and titles of professor of forest sciences and doctoral students

Years	Degrees in the field of forest sciences		Titles of professor of forest sciences	Doctoral students
	PhD	Doctor habilitated		
2000	32	10	6	136
2001	30	5	8	171
2002	35	14	10	202
2003	42	7	7	175
2004	63	6	4	163
2005	28	11	7	206
2006	33	7	4	219
2007	35	9	3	207
2008	27	8	2	226
2009	24	12	2	222
2010	39	10	3	169
average	35	9	5	190

Data according to GUS

Table 6. The list of centres educating foresters on higher level

Universities (current names)	Period of activity (Since)	Type of studies
<b>A. Full academic authorization</b>		
The Faculty of Forestry of Warsaw University of Life Sciences-SGGW	1945	I, II, III, S, N
The Faculty of Forestry of Poznań University of Life Sciences	1945	I, II, III, S, N
The Faculty of Forestry of H.Kołłątaj University of Agriculture in Krakow	1945 - 1954 i od 1963	I, II, III, S, N
<b>B. Authorization of vocational schools of higher education</b>		
The Faculty of Forestry of Polytechnical University of Białystok in Hajnówka (in the years of 2002-2008 environmental protection with specialisation of management on areas of environmental value; since 2008 education on the faculty of forestry)	2002	I, S, N
Higher School of Environmental Management in Tuchola, the department of forestry	2005	I, S, N
The Institute of Forest Sciences of the University of Łódź in Tomaszów Mazowiecki	2009	I, S
The Didactic Centre of the Faculty of Forestry of Poznań University of Life Sciences in Milicz	2010	I, N
The Faculty of Shaping the Environment and Agriculture of the Warmian-Mazurian University in Olsztyn, the department of forestry	2011	I, S
Agrobioengineering Faculty of Lublin University of Life Sciences, department of forestry	2011	I, S, N

I - bachelor studies (engineer), II - master studies, III - doctoral studies, S - stationary studies, N - non-stationary studies

Table 7. Graduates of forestry faculties and some related fields (agricultural and forest technology, environmental engineering, environmental protection) in 2010.

Field of study	Graduates	
	Total	Stationary studies
Environmental Engineering	4906	3202
Forestry	1068	600
Environmental Protection	6211	4223
Agricultural and Forest Technology	1193	826

According to GUS (2011)

Table 8. Examples of differences between contemporary („e”) and future system of education („E”)

Contemporary education - e	Future education - E
Teaching a subject	Shaping a human in the context of a subject
Program of education does not depend on the context of students' life so far	Life context (practical context) is a stimulus to learn important and needed information and skills
Focusing on students' mistakes (they are 'punished' for the Lack of knowledge and understanding until they fulfill requirements, even virtually)	Improving on what we are already efficient at, which allows to notice new elements and fields worth knowing and building on our advantages
Separating value from object	Natural connection of objects with value
Testing and examining according to a fixed scheme	Individualized testing of progress
Checking short term memorizing in order to pass a subject	Assessment of student's activity in practice
System originating in the 17th century (from Komenski)	System based on modern pedagogical knowledge
Lack of system of accounting teachers from effects of teaching	System of accounting teachers from development of students' knowledge and skills
Educating according to age level	Individualized education, throughout lifetime
Lack of self control of the educational system	Regular process of system self correction
Obligation of learning	Learning at free will
-	Physical development of brain since birth.
-	10 thousand hours is the time necessary to improve skills essential to achieve the level of an expert

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